

REMARKS

Claims in Application. Claims 3, 4, 10, 15 and 16 have now been cancelled from this application. Claims 21-26 have been added to this application. Accordingly, Claims 1-2, 5, 7-9, 11-14 and 18-26 are active in this application. Reconsideration is respectfully requested.

Scope of Claims of Applicant. Applicants' claims are directed to novel polyurethane films (Claims 1-2, 5, 7-8 and 19-20) and a method of making the same (Claims 9, 11-12) and an aqueous polyurethane dispersion (Claims 13-14 and 18) useful for preparing the polyurethane film. The dispersions are made by first preparing the non-ionic prepolymer. Water and an anionic surfactant are then added to the prepolymer, all in the substantial absence of an organic solvent, thereby rendering the polyurethane dispersion. The polyurethane dispersions produced by the claimed process exhibit properties similar to natural rubber latexes without the inclusion of dermal irritants and solvents.

Applicant previously submitted Declaration of Bedri Erdem, Ph.D. Under 37 C.F.R. §1.132, filed June 27, 2002. This Declaration was accompanied with Supplemental Response to Amendment of May 29, 2002. To date, the Examiner has not acknowledged the Declaration. For the convenience of the Examiner, a duplicate copy of the Declaration and Supplemental Amendment is attached. The Declaration illustrates that a polyurethane dispersion prepared by the addition of water and anionic surfactant to a polyurethane prepolymer renders unexpected results over the process wherein an anionic surfactant is added to a previously formed polyurethane dispersion. In particular, the Declaration establishes that the claimed method of

Applicant renders a stable polyurethane dispersion whereas the process of adding an anionic surfactant to a previously formed polyurethane dispersion does not render a stable dispersion.

Examiner's Rejection of Claims Under 35 U.S.C. § 103(a). The Examiner has rejected Claims 1-5, 7-16 and 18-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,380,596 ("*Markusch*") in view of U.S. Patent No. 4,184,989 ("*Flakus*") or U.S. Patent No. 6,017,998 ("*Duan*"). This rejection is traversed. Reconsideration is therefore requested.

Markusch discloses a polyurethane dispersion to which may be blended an anionic surfactant. Note the discussion in lines 14-21 of column 13. *Markusch* does not disclose the formation of a dispersion of a polyurethane prepolymer in the presence of an anionic surfactant, as specifically claimed by Applicant. At best then, *Markusch* discloses the comparative example set forth by Dr. Erdem in the previously submitted Declaration.

The Examiner attempts to cure the deficiencies of *Markusch* through *Flakus* or *Duan*. However, the combination of either *Flakus* or *Duan* with *Markusch* would **not** render the claims of Applicant.

While *Flakus* may be directed to a process for preparing a solvent-free aqueous dispersion of a polyurethane, neither (i.) the formation of the prepolymer nor (ii.) the formation of the aqueous dispersion of the prepolymer is formed "in the substantial absence of an organic solvent" as required by each of the claims of Applicant. For instance, note that the formation of the polyester and uretdione or triisocyanurate occurs *in the presence of ketonic solvents*. See lines 24-32 of column 2 of *Flakus*. Further, note that all of the examples disclose the reaction of the polyester/uretdione triisocyanurate reaction product with diamine *in the presence of an*

organic solvent, i.e., acetone. Following this reaction, the reaction product is “stripped free of acetone”. Thus, the combination of *Markusch* and *Flakus* does not render the claimed subject matter of Applicant.

The combination of *Markusch* and *Duan* is equally improper. *Duan* is directed to a dispersion formed by reaction of an isocyanate-terminate polyurethane prepolymer with an aqueous polyurethane dispersion and water. Note the bridging paragraph in columns 3 and 4 of *Duan*. The bridging paragraph of columns 7 and 8, as well as lines 21-38 of column 8, of *Duan* focuses on dispersing the prepolymer reactant in the aqueous polyurethane dispersion. Note that the prepolymer is dispersed by either adding the prepolymer to the aqueous polyurethane dispersion or by adding the aqueous polyurethane dispersion to the prepolymer. Further, while lines 62-65 of column 7 may indicate that a co-solvent “may be present in the prepolymer”, the clear teaching of *Duan* is that a co-solvent is used, “preferably from about 1% by weight to about 5% by weight.” In all of the examples, the prepolymer is made in the presence of acetone.

The Examiner concludes that:

since anionic surfactants were known dispersants for dispersing polyurethane prepolymers within water, the position is taken that it would have been *prima facie* obvious to employ such surfactants for their art recognized utility with the method of *Markusch*, so as to arrive at the instant invention. (Paragraph 6 of Office Action.)

The Examiner’s rationale is however not understood. Mere substitution of an anionic surfactant into the process of *Markusch* would not render the claimed invention since *Markusch* provides no teaching of formation of the prepolymer dispersion in the presence of the anionic surfactant.

The rejection of the claims over *Markusch* and *Duan* should therefore be withdrawn especially in light of the comparative showing of Dr. Erdem.

Further, the references are improperly combinable because one of skilled in the art would not have been motivated to combine them. *Markusch* teaches away from the present invention. A prior art reference may be considered to teach away when “a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir. 1994). *Markusch* teaches away from the addition of an anionic surfactant to render an aqueous dispersion having the claimed particulate sizes. The aqueous systems of *Markusch* are already dispersed. Assuming that one skilled in the art could permissibly combine the references relied upon by the Examiner, what motivation would one have to do so? In other words, why look to a secondary reference for a teaching for the use of an anionic surfactant when the systems of *Markusch* are already dispersed?

Examiner’s Rejection of Claims 3, 4, 10, 15 and 16 Under First Paragraph of 35 U.S.C. § 112. The Examiner has further rejected Claims 3, 4, 10, 15 and 16 under the first paragraph of 35 U.S.C. 112. The cancellation of Claims 3, 4, 10, 15 and 16 renders a discussion of this rejection unnecessary.

Newly Presented Claims 21-26. Applicant has presented with this Amendment, newly added Claims 21-26. Newly added Claims 21-23 recite a polyurethane film prepared from a polyurethane dispersion, the dispersion being prepared from a polyurethane prepolymer which is

not derived from an amine chain extender. The Table on page 13 of Applicant's specification shows that the films made from dispersions having no amine chain extenders have substantially improved properties such as tensile strength and stress at 100% elongation. *Compare*, for instance, Example 1 with Example 2. The polyurethane prepolymer of *Markusch* is derived from an amine chain extender. Claims 24-26 recites a polyurethane dispersion made by dispersing in water a nonionic polyurethane prepolymer prepared from a prepolymer formulation including an MDI diisocyanate, the MDI having a P, P'-isomer content from 99 to 90 percent. See lines 4-6 of page 5 of specification. Claim 24 is inventive because the Table on page 13 shows that the film made from a dispersion utilizing ~ 95.7 percent P,P' MDI (Example 4)¹ had much improved properties (e.g., tensile strength) compared to Example 3², which had ~ 75.5% P, P' MDI.

¹ Example 4 shows

$$4, 4' = [0.98(29.1) + 0.5(4.2)]/32 = .9568$$

² Example 3 shows

| | Concentration | Amount pbw |
|------------|---------------|------------|
| Polyol A = | 98% 4, 4' MDI | 17 |
| Polyol B = | 50% 4, 4' MDI | 15 |

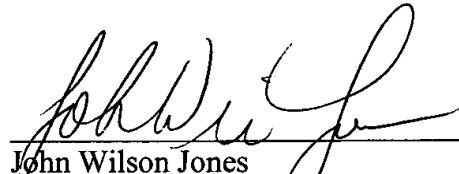
$$4, 4' = [0.98(17) + 0.5(15)]/32 = .755$$

CONCLUSIONS

In view of the foregoing amendments and remarks, Applicant respectfully requests the Examiner to promptly issue a Notice of Allowance. The Examiner is invited to telephone the undersigned should it be deemed prudent to expedite examination of this application.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on this the 2nd day of July, 2003.



Jana Walraven